



# Instrumental Conditioning

Psychology 390  
Psychology of Learning  
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## Instrumental Conditioning

In CC, the relationship between the two stimuli before the conditioned or unconditioned response is important.

In Instrumental Conditioning the relationship between the stimulus and the response are important.

Thus, what the stimuli does is the focus of the process, and how the stimulus influences the response.

Called S – R Psychology

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## Beginnings of Instrumental Conditioning

- Thorndike
- Guthrie

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## Thorndike (1874 - 1949)

- Perhaps the greatest learning theorist of all time.
- Published over 507 books, articles, and monographs.
- Did work in learning plus,
  - educational practices
  - verbal behavior
  - comparative psychology
  - nature - nurture problem
  - developed scales to compare quality of life in cities
  - many others
- Attempted to measure everything.

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## Thorndike (1874 - 1949)

- Began work with Cattell
- Started his work with chicks then switched to cats.
- Developed a methodology that was suitable to study animal learning and human learning as well.

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## Connectionism

- Was the association between sensory impressions and actions taken by the organism.
- Believed the connections were neural.

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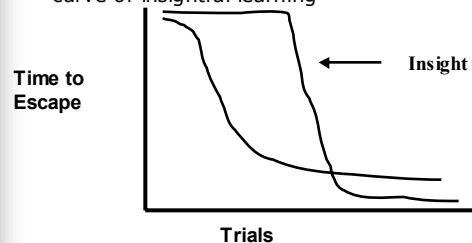
### Trial and Error Learning

- For Thorndike, it was the most basic form of learning.
- Worked with cats in puzzle boxes.
- Put cat in the box and the cat goes nuts trying to get out.
- After some period 5-10 minutes the cat accidentally contacts the escape mechanism and gets out.

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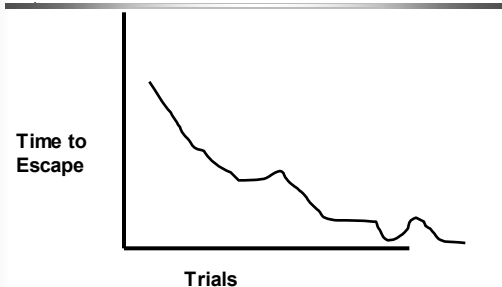
### Trial and Error Learning

- If cat forms an association, the next time in the box it gets out faster.
- If so, you should see a very rapid learning curve or insightful learning



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Instead he saw this.



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### Conclusion

- Learning was an incremental or a gradual process.
  - Occurs in small steps
- Was not developed by insight.
- Learning is not mediated by ideas.
  - Animals do not look over the situation.
  - They do not think it over before making a response.
- Rejected reasoning in favor of developing a direct connection.

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### Animals Learn in the Same Manner

- Found the same things in other organisms ( Apes).
- Humans also learn the same way.
- There are no major differences between the way humans learn and the way other organisms learn.

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### Thorndike before 1930

- Theories about the learning process are broken into two eras:
  - Before and after 1930
- Developed several laws.
  - Law of Readiness
  - Law of Exercise
  - Law of Effect

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### Law of Readiness

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- Had three parts.
- When someone is ready to perform some act, to do so is satisfying.
- When someone is ready to perform some act, to not do so is annoying.
- When someone is not ready to perform some act and is forced to do so, it is annoying.

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### Law of Readiness

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- When you interfere with goal directed behavior, you become frustrated.
- When you cause someone to do something they are not ready to do it is also frustrating.

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### Terms

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- Satisfying and Annoying were acceptable to even modern behaviorists.
- A satisfying state of affairs =
  - One where the animal does nothing to avoid it and often do things to attain/achieve it or preserve it.
- Discomforting or annoying state of affairs =
  - One where the animal avoids or abandons the situation.

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### Law of Exercise

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- Connections between a S and R are strengthened when they are used. The more they are used, the stronger they become.
  - Called the Law of Use
- Connections between S and R are weakened when practice is discontinued or not used.
  - Called the Law of Disuse

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### Strengthening and Weakening

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- Strengthening = An increase in the probability that a response would occur when a stimulus is presented.
- If the bond between the S & R is strengthened, then the next time the S is presented, there is an increased probability that a response will occur.
- If the bond is weakened, there is a decreased probability the response will occur.

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### Law of Effect

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- When a response is followed by a satisfying state of affairs the strength of the connection is increased.
- When a response is followed by an annoying state of affairs the strength of the connection is decreased.

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### Restated

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- If a stimulus leads to a response, which then leads to reinforcement, the S - R connection is strengthened.
- If a stimulus leads to a response, which then leads to the delivery of a punishing stimulus, the S - R connection is weakened.

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### Implications

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- Was greater than traditional association theories which claimed the frequency of occurrence or contiguity was the determiner of association strength.

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### Implications

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- Needed to have the associations and / or the contiguity of occurrence.
- However, the consequences were also important in determining the association strength.

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### How was S - R Connection Strengthened?

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- Postulated the existence of a confirming reaction.
- Was triggered in the nervous system if the response caused a satisfying state of affairs.
- Was neurophysiological in nature and not conscious to the organism.

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### Other Concepts

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- Were not as important as the primary laws that Thorndike developed.
- Included
  - Multiple Response
  - Set or Attitude
  - Prepotency of Elements
  - Response by Analogy
  - Association Shifting

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### Multiple Response

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- Is the first step in all learning.
- If our first response does not solve the problem, we try other responses.
- Basically, we continue until a response solves an existing problem.

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### Set or Attitude

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- What an organism brings to the learning situation is extremely important.
- Individual differences in learning can be explained by cultural differences, genetic history, fatigue, deprivation, etc.
- What acts as a satisfier or annoyer depends on the organisms background and body state at the time of learning.

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### Prepotency of Elements

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- Is the partial or piecemeal activity of a situation.
- Only some elements of a situation govern behavior.
- Generally, of all stimuli in an environment, we only respond to some of them.
- How we respond also depends on what we attend to and what responses are attached to what we attend to.

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### After 1930

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- Renounced the Law of Exercise.
- Mere repetition did not strengthen a response.
- May get minor improvement but not much else.

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### Revised the Law of Effect

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- Only part was true was when a response resulted in a satisfying state of affairs.
- Reinforcement increases the strength of a connection.
- Punishment has nothing to do with the strength of a connection.
  - Was wrong here

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### Belonginess

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- Found, if the elements of an association somehow belonged together, the association between them was learned and retained more readily than if the elements did not belong together.

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